

What is claimed is:

1. A circuit structural body comprising:
 - a semiconductor switching element;
 - a power circuit for outputting an inputted electric power through the semiconductor switching element;
 - a control circuit for controlling drive of the semiconductor switching element; and
 - a printed circuit board having a board body, a conductive pattern constituting the power circuit and disposed on one surface thereof, and a conductive pattern constituting the control circuit and disposed on the other surface thereof;wherein the board body has a through-hole for mounting the semiconductor switching element thereon; and
the semiconductor switching element is mounted to one of the conductive patterns on the printed circuit board from the front side of the conductive pattern, and to the other conductive pattern from the backside of the conductive pattern through the through-hole.
2. The circuit structural body according to claim 1, further comprising a reinforcing plate laminated over one of the conductive patterns of the printed circuit board to which the semiconductor switching element is mounted from the backside of the conductive pattern.

3. The circuit structural body according to claim 2, wherein the reinforcing plate is formed of an aluminum plate or an aluminum alloy plate; and

the reinforcing plate is overlapped on one of the conductive pattern on the printed circuit board via an insulating layer.

4. The circuit structural body according to claim 1, wherein the semiconductor switching element has a conductive terminal on the back side of a main body thereof;

the through-hole has a size which can accommodate the main body of the semiconductor switching element therein; and

the conductive terminal on the backside of the main body of the semiconductor switching element is mounted to the conductive pattern which constitutes the power circuit via the through-hole.

5. The circuit structural body according to claim 4, further comprising a reinforcing plate formed of aluminum or aluminum alloy and fixed via an insulating layer to one of the surfaces of the printed circuit board having the conductive pattern which constitutes the power circuit thereon.

6. The circuit structural body according to claim 2, wherein the reinforcing plate is fixed to a heat dissipating member via

an insulating layer.

7. The circuit structural body according to claim 5, wherein the reinforcing plate is fixed to a heat dissipating member via an insulating layer.

8. The circuit structural body according to claim 1, wherein a terminal for connecting the power circuit or the control circuit to an external circuit is connected to the adequate conductive pattern on the printed circuit board.

9. The circuit structural body according to claim 8, further comprising:

a case for accommodating the printed circuit board; and
a housing disposed on the case for surrounding the terminal and constituting a connector together with the terminal.

10. The circuit structural body according to claim 9, wherein the terminal is fixed to the printed circuit board in a state in which the terminal penetrates through the printed circuit board in the direction of thickness of the printed circuit board and projects into the housing through the case in the direction of thickness.

11. The circuit structural body according to claim 9, wherein

the case is divided along the direction parallel to the printed circuit board; and

divided case halves are connected to each other with the printed circuit board interposed therebetween.

12. The circuit structural body according to claim 9, further comprising a heat dissipating member for cooling the printed circuit board;

wherein the printed circuit board is interposed between the heat dissipating member and the case.

13. A method of manufacturing a circuit structural body provided with a power circuit for outputting an electric power supplied to an input unit to an output unit via a semiconductor switching element, and a control circuit for controlling drive of the semiconductor switching element, the method comprising the steps of:

manufacturing a printed circuit board having a board body, a conductive pattern constituting the power circuit and disposed on one surface thereof, a conductive pattern constituting the control circuit and disposed on the other surface thereof, and a through-hole for mounting the semiconductor switching element on the board body;

fixing a reinforcing plate to one surface of the printed circuit board via an insulating layer; and

mounting the semiconductor switching element directly to one of the conductive patterns on the printed circuit board from the opposite side to the reinforcing plate and mounting the same to the other conductive pattern through the through-hole.

14. The method of manufacturing a circuit structural body according to claim 13, wherein a step having a height corresponding substantially to the thickness of the printed circuit board is provided before the mounting step between the terminal of the semiconductor switching element which is to be mounted to the conductive pattern on the front side of the printed circuit board and the terminal of the same which is to be mounted through the through-hole.

15. The method of manufacturing a circuit structural body according to claim 13, further comprising the step of connecting a terminal for connecting the power circuit or the control circuit to the external circuit to the adequate conductive pattern on the printed circuit board;

wherein the connecting step is conducted after the manufacturing step and in a state in which the terminal being passed through the printed circuit board.

16. The method of manufacturing a circuit structural body according to claim 15, further comprising the step of forming

a housing of an insulating material around the terminal;

wherein the forming step is conducted after the connecting step.

17. The method of manufacturing a circuit structural body according to claim 13, wherein the reinforcing plate formed of aluminum or aluminum alloy is fixed to the printed circuit board in the fixing step; and

a heat dissipating member is connected to the reinforcing plate via an insulating layer after the mounting step.